CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF SCIENCE IN BIOCHEMISTRY, BACHELOR OF SCIENCE IN BIOMED AND BACHELOR OF EDUCATION (SCIENCE)

BOTA 302: BIOSTATISTICS

STREAMS:BSC BIOC,BIOMED,BED(SCI)   **TIME: 2 HOURS**

DAY/DATE: MONDAY 4/12/2017   **2.30 P.M- 4.30 P.M**

INSTRUCTIONS:
- **Answer all the questions in section 1 and two questions in section II**
- **Do not write anything on the question paper**

SECTION 1 (30MARKS)

1.   (a) Describe the steps in a statistical survey.   [3marks]

      (b) Differentiate between cluster and stratified random sampling.   [2marks]

      (c) Outline the steps in hypothesis testing.   [2marks]

2.   Explain the meaning of the following terms when used in experimental design. [8marks]

      (a) Treatment

      (b) Randomization

      (c) Replication

      (d) A factor

3.   Genetic theory states that three types of blood groups, MM,MN and NN, will on average be as 1:2:1, respectively. A random sample of 300 individuals was taken and 30%

individuals were found to be type MM, 45% type MN, and remainder type NN. At 5% signal level does the observed information agree with the expected ratios . [5marks]

4. A genetics lecturer decides to give a multiple choice test consisting of 8 questions each with 4 possible answers one of which is correct. A student who feels that his chances of passing the test are very slim decides to guess in all the eight questions.

    (a) What is the probability that the student scores correctly on 50% of the questions?
    (b) If for one to get a grade A on the test , he must get at least 7 of the questions correct, what is the probability that this student will score a grade A?   [4marks]
    (c) What is the probability that the student scores not more than one question correctly?
                                                                                    [4marks]

SECTION II (40MARKS]

5. The following data represent the amount of cucurbitacin obtained from different varieties of pumpkin:

Pumpkin variety	Replicate 1	Replicate 2	Replicate 3	Replicate 4
A	22	22	18	17
B	29	18	21	20
C	17	18	19	23
D	16	19	18	18
E	30	25	24	27

    Perform analyze of variance and test if the five varieties of pumpkin yields significantly different amount of cucurbitacin at 5% significance level.   [20marks]

6. (a) Using the following data set, calculate the mean, mode, medium ,standard deviation coefficient of variation and Pearson measure of skewness of successive sale of a given firm.   [12marks]

Number of sales	0 - 4	5 -9	10 - 14	15 -19	20 - 24	25 -29
Number of salesmen	4	20	39	59	45	31

    (b) The following set of measurements was taken from a normally distributed population : 63,45,67,52,39,68,48,78,66,56,35,89,46,34,61,75 and 63. Construct a 95% and 99% confidence interval for the population mean.   [8marks]

7.　(a) Nine judges are to judge two type of foodstuffs (A & B) on a scale of 1 -9 so as to determine if the two foodstuff have equal rating. The following data was obtained from the 9 judges rating of the foodstuffs.

Food type/ judge	1	2	3	4	5	6	7	8	9
A	4	8	5	2	6	5	4	5	7
B	6	4	2	6	9	3	7	8	5

At 5% significance level determine if the two foodstuffs equal rating.　　[8marks]

(b) Using the following data fit a regression model and obtain a correlation coefficient.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　[12marks]

X	2	4	6	7	10	11	14
Y	7	15	21	29	35	41	57